

WHAT IS CLAIMED IS:

1 1. A programmable thermostat system for controlling space conditioning  
2 equipment comprising:

3 A) a temperature sensor for providing an electrical signal indicative of  
4 the temperature of a conditioned space in which the temperature sensor  
5 is situated;

6 B) a transparent touch pad juxtaposed over a liquid crystal display to  
7 constitute a touch screen for interactive interface with a user;

8 C) a processor, said processor including:

9 1) a central processing unit;

10 2) a real time clock;

11 3) a memory coupled to said central processing unit for storing  
12 program and data information; and

13 4) an input/output unit coupled between said processor and said  
14 touch screen for carrying out information transfer therebetween,  
15 said input/output unit further including:

16 a) a sensor input coupled to said temperature sensor for  
17 receiving said electrical signal therefrom; and

18 b) a control output coupled to the space conditioning  
19 equipment for issuing control signals thereto; and

20 D) a program stored in said memory for causing said central processing  
21 unit to communicate through said input/output unit to selectively:

22 1)a) establish on said liquid crystal display a representation of at  
23 least one button at a first predetermined position on the  
24 liquid crystal display;

25 1)b) read the position on the touch pad juxtaposed with said first  
26 predetermined position on the liquid crystal display to  
27 determine if the representation of said at least one button  
28 has been touched; and

29 1)c) if said at least one representation of a button has been  
30 touched, making a predetermined response thereto; and

31 2)a) periodically read said electrical signal from said  
32 temperature sensor;

33 2)b) in response to the value of the electrical signal read in step  
34 D)2)a) determining if at least one control signal to the  
35 space conditioning equipment is required in order to  
36 maintain the temperature in the conditioned space within a  
37 predetermined range; and

38 2)c) if it determined in step D)2)b) that said at least one signal is  
39 required, issuing said at least one control signal.

1 2. The thermostat system of Claim 1 in which said transparent touch pad is  
2 selected from within the classes of touch screens including: resistive matrix,  
3 resistive analog, capacitance, scanning infrared, surface wave and near field  
4 imaging.

1 3. A programmable thermostat system for controlling space conditioning  
2 equipment comprising:

3 A) a temperature sensor for providing an electrical signal indicative of  
4 the temperature of a conditioned space in which the temperature sensor  
5 is situated;

6 B) a transparent touch pad juxtaposed over a liquid crystal display to  
7 constitute a touch screen for interactive interface with a user;

8 C) a processor, said processor including:

9 1) a central processing unit;

10 2) a real time clock;

11 3) a memory coupled to said central processing unit for storing

12 program and data information; and

13 4) an input/output unit coupled between said processor and said  
14 touch screen for carrying out information transfer therebetween,  
15 said input/output unit further including:

16 a) a sensor input coupled to said temperature sensor for  
17 receiving said electrical signal therefrom; and

18 b) a control output coupled to the space conditioning  
19 equipment for issuing control signals thereto; and

20 D) a program stored in said memory for causing said central processing  
21 unit to communicate through said input/output unit to selectively:

22 1) establish on said liquid crystal display a representation of at  
23 least one button at a first predetermined position on the  
24 liquid crystal display;

25 2) read the position on the touch pad juxtaposed with said first  
26 predetermined position on said liquid crystal display to  
27 determine if the representation of said at least one button  
28 has been touched;

29 3) if said at least one representation of a button has been  
30 touched, displaying a plurality of distributed  
31 representations of buttons on said liquid crystal display,  
32 each button representing a corresponding choice of

33 thermostat system settings which can be selected by  
34 touching said touch pad at the selected representation;  
35 4) read the positions on the touch screen juxtaposed with each of  
36 said distributed representations of buttons to determine if  
37 at least one representation of a button displayed in step  
38 D)3) has been touched; and  
39 5) is said at least one representation of a button displayed in step  
40 D)4) has been touched, processing this information to  
41 establish a condition incorporated into the operation of  
42 said thermostat system.

1 4. The thermostat system of Claim 3 in which said touch pad is selected from  
2 within the classes of touch screens including: resistive matrix, resistive  
3 analog, capacitance, scanning infrared, surface wave and near field imaging.

1 5. The thermostat system of Claim 1 in which said central processor  
2 selectively generates, from information stored in said memory, an  
3 alphanumeric message for display on said liquid crystal display to convey  
4 system information to a user.

1 6. The thermostat system of Claim 2 in which said central processor  
2 selectively generates, from information stored in said memory, an  
3 alphanumeric message for display on said liquid crystal display to convey  
4 system information to a user.

1 7. The thermostat system of Claim 3 in which said central processor  
2 selectively generates, from information stored in said memory, an  
3 alphanumeric message for display on said liquid crystal display to convey  
4 system information to a user.

1 8. The thermostat system of Claim 4 in which said central processor  
2 selectively generates, from information stored in said memory, an  
3 alphanumeric message for display on said liquid crystal display to convey  
4 system information to a user.

1 9. The thermostat system of Claim 5 in which said central processor  
2 selectively generates, from information stored in said memory, an  
3 alphanumeric message, for display on said liquid crystal display, setting forth  
4 a result which will be achieved is said at least one representation of a button  
5 is touched.

1 10. The thermostat system of Claim 6 in which said central processor  
2 selectively generates, from information stored in said memory, an  
3 alphanumeric message, for display on said liquid crystal display, setting forth  
4 a result which will be achieved is said at least one representation of a button  
5 is touched.

1 11. The thermostat system of Claim 7 in which said central processor  
2 selectively generates, from information stored in said memory, an  
3 alphanumeric message, for display on said liquid crystal display, setting forth  
4 a result which will be achieved is said at least one representation of a button  
5 is touched.

1 12. The thermostat system of Claim 8 in which said central processor  
2 selectively generates, from information stored in said memory, an  
3 alphanumeric message, for display on said liquid crystal display, setting forth  
4 a result which will be achieved is said at least one representation of a button  
5 is touched.

1 13. The thermostat system of Claim 9 in which said central processor  
2 selectively generates, from information stored in said memory, a linking  
3 indicator extending from proximate said alphanumeric message to said at  
4 least one representation of a button to signify their relationship.

1 14. The thermostat system of Claim 10 in which said central processor  
2 selectively generates, from information stored in said memory, a linking  
3 indicator extending from proximate said alphanumeric message to proximate  
4 said at least one representation of a button to signify their relationship.

1 15. The thermostat system of Claim 11 in which said central processor  
2 selectively generates, from information stored in said memory, a linking  
3 indicator extending from proximate said alphanumeric message to proximate  
4 said at least one representation of a button to signify their relationship.

1 16. The thermostat system of Claim 12 in which said central processor  
2 selectively generates, from information stored in said memory, a linking  
3 indicator extending from proximate said alphanumeric message to proximate  
4 said at least one representation of a button to signify their relationship.



1 17. A programmable thermostat system for controlling space conditioning  
2 equipment comprising:

3 A) a temperature sensor for providing an electrical signal indicative of  
4 the temperature of a conditioned space in which the temperature sensor  
5 is situated;

6 B) a transparent touch pad juxtaposed over a liquid crystal display to  
7 constitute a touch screen for interactive interface with a user;

8 C) a processor, said processor including:

9 1) a central processing unit;

10 2) a real time clock; and

11 3) a memory coupled to said central processing unit for storing  
12 program and data information; and

13 D) a program stored in said memory for causing said central processing  
14 unit to selectively:

15 1) establish on said liquid crystal display a first menu which  
16 includes a first representation of a button at a first  
17 predetermined position;

18 2) read the position on the touch pad juxtaposed with said first  
19 predetermined position to determine if said first  
20 representation of a button has been touched;

21 3) if said first representation of a button has been touched,  
22 displaying a second menu which includes a second  
23 representation of a button at a second predetermined  
24 position;

25 4) read the position on the touch pad juxtaposed with said  
26 second predetermined position to determine if said second  
27 representation of a button has been touched; and

28 5) if said second representation of a button has been touched,  
29 processing this information to establish a condition  
30 incorporated into the operation of said thermostat system.

1 18. The thermostat system of Claim 17 in which:

2 A) during step D)3), said second menu further includes a third  
3 representation of a button at a third predetermined position;

4 B) during step D)4), the position on the touch pad juxtaposed with said  
5 third predetermined position is read to determine if said third  
6 representation of a button has been touched; and

7 C) during step D)5), if said third representation of a button has been  
8 touched, processing this information to establish a second condition  
9 incorporated into the operation of said thermostat system